

LABORATORIES AND SYSTEMS DEVELOPED:

- Established the software engineering research lab by combining donations and other research support. The lab contains a high performance network of workstations with a fiber-optic FDDI net, multiprocessors, symmetric hardware and software configurations, and much support software. The purpose of the lab is to support research on computer-aided prototyping of real-time systems in the context of multi-processor target architectures.
- Designed the software engineering teaching lab. Includes extensive software tools for computer-aided software design running on a network of workstations.
- Appraised and evaluated more than 60 software systems and tools.
- Developed the Prototype System Description Language PSDL for defining prototypes of real-time systems in Ada. Includes support for specifications; data, operation, and control abstractions; non-procedural control and timing constraints; timers and a graphical representation for system decompositions.
- Developed the Computer-Aided Prototyping System CAPS for constructing prototypes of real-time systems in Ada. Includes a translator, several static schedulers, a dynamic scheduler, a syntax-directed editor, a graphical editor, a debugger, a design database, a software base management system and an evolution control system.
- Developed prototypes of a C3I system, a message processor for a combat direction system, a controller for an autonomous underwater vehicle, a robot, an autopilot, a missile, a temperature control system and a controller for a fish farm. This effort demonstrates the feasibility of describing realistic real-time systems using PSDL.

CURRICULUM DEVELOPMENT:

- Created new M.S. and Ph.D. degree programs in Software Engineering.
- Developed 15 new courses to support M.S. and Ph.D. programs.
- Developed new distance learning M.S. program for Army TACOM.
- Developed new distance learning Ph.D. program for Navy SPAWAR.
- Worked on the accreditation of the Software Engineering program in 2000 and 2001.
- Developed 6 new Software Engineering handbooks on SE curriculums.
- Worked with the NPS Engineering & Technology Curricular Officer to Develop new Software Engineering curriculum for Engineering Duty Officers & Unrestricted Line Officers as requested by Naval Sea Systems Command.

THESIS STUDENTS AND THESIS TOPICS SUPERVISED:

- O'Hern, J. "A Conceptual Level Design for a Static Scheduler for Hard Real-Time Systems." March 1988. Graduated with distinction.

- Janson, D. "A Static Scheduler for the Computer Aided Prototyping System: An Implementation Guide." March 1988.
- Marlowe, L. "A Static Scheduler for Critical Timing Constraints." December 1988.
- Altizer, C. "Implementation of a Language Translator for the Computer Aided Prototyping System." December 1988. Received Grace Murray Hopper Award.
- Wood, M. "Run-time Support for Rapid Prototyping." December 1988.
- Raum, H. "Design and Implementation of an Expert User Interface for the Computer Aided Prototyping System." December 1988. Graduated with distinction.
- Thorstenson, R. "A Graphical Editor for the Computer Aided Prototyping System." December 1988.
- Galik, D. "A Conceptual Design of a Software Base Management System for the Computer Aided Prototyping System." December 1988.
- Guentenburg, H. "Case Study on Rapid Prototyping & Automated Software Generation: An Inertial Navigation System." June 1989.
- White, L. "The Development of a Rapid Prototyping Environment." January 1990. Received Grace Murray Hopper Award.
- Cervantes, J. "An Optimal Static Scheduling Algorithm for Hard Real-Time Systems Specified in a Prototyping Language." January 1990.
- Fountain, H. "Rapid Prototyping: A Survey and Evaluation of Methodologies and Models." March 1990.
- Sun, J. "Developing Portable User Interfaces for Ada Command Control Software." June 1990.
- Hsu, H. "Multiprocessor Scheduling for Hard Real-Time Software." June 1990.
- Seveney, J., and G. Steinberg. "Requirements Analysis for a Low Cost Combat Direction System." June 1990.
- Mostov, I. "A Model of Software Maintenance for Large Scale Military Systems." June 1990. Received Highest Academic Achievement Award.
- Huskins, J. "Issues in Expanding the Software Base Management System Supporting the Computer Aided Prototyping System." June 1990.
- Palazzo, F. "Integration of the Execution Support System for the Computer Aided Prototyping System (CAPS)." September 1990.
- Anderson, S. "Functional Specification for a Generic C3I Workstation." September 1990. Graduated with distinction.
- Manley, G. "The Classification and Evaluation of Computer Aided Software Engineering Tools." September 1990.
- Coskun, V. and C. Kesoglu. "A Software Prototype for a Command, Control, Communications and Intelligence (C3I) Workstation." December 1990.

- Cummings, M. "The Development of User Interface Tools for the Computer Aided Prototyping System." December 1990. Received Grace Murray Hopper Award and DoD Award.
- Levine, J. "An Efficient Heuristic Scheduler for Hard Real-Time Systems." September 1991.
- Dwyer, A. and G. Lewis. "The Development of a Design Database for the Computer Aided Prototyping System." September 1991.
- McDowell, J. "A Reusable Component Retrieval System for Prototyping." September 1991. Graduated with Distinction.
- Oloughlin, M. "Version and Variation Control of a Design Database for Computer-Aided Prototyping System." June 1992.
- Hammar, G. "FDDI Implementation and Performance Analysis." September 1992.
- Ellis, M. "Computer Aided Prototyping for Acquisition of C3I Systems." June 1993.
- Dolgoff, S. "Automated Interface for Retrieving Software Reusable Components." September 1993. Received Grace Murray Hopper Award.
- Eagle, C. "Tools for Storage and Retrieval of Ada Software Components in a Software Base." March 1995. Received Grace Murray Hopper Award.
- Hong, R. "User Interface and Database Design." March 1996.
- Nguyen, T. "Populating the Software Database." March 1996.
- Grosenheider, S. "Enhancements for the CAPS Prototyping System Description Language Syntax-Directed Editor." March 1996.
- Irwin, D. "Re-engineering of the Computer-Aided Prototyping System for Portability." September 1996.
- Angrisani, D. and G. Whitbeck. "Software System Requirements for the Army Tactical Missile System." September 1996.
- Cooke, R. "Technology Transfer of Computer Aided Prototyping System." September 1996.
- Bell. "Documentation for CAPS User Interface and Graphic Editor." March 1997.
- Sotero, S. and E. Yetkin. "Re-engineering Portability of Computer Aided Prototyping System." March 1997.
- Rusin, D. "Application of the Rapid Computer Aided Prototyping System (CAPS) in the Development of a Sudden Infant Death Syndrome (SIDS) Monitor." June 1997.
- Leonard, T. "Front Loaded Accurate Requirements Engineering (FLARE); A Requirements Analysis Concept for the 21st Century." June 1997.
- Bailey, F. and C. Robbins. "Real-Time, Remotely Controlled, Unmanned, Surface Combatant (RTRCUSC) Using the Internet." September 1997.
- Dabose, M. "Autonomous Agents for Digital Network Maximization." September 1997.
- Evans, J. "Project Scheduling Tool." September 1997.
- Herman, J. "Improving Syntactic Matching for Multi-Level Filtering." September 1997.

- Keesling, W. "Decomposition Recovery Extension to the Computer-Aided Prototyping System (CAPS) Change-Merge Tool." September 1997.
- Garingo, G. "Java Based Data Connectivity." September 1997.
- Plutchak, B. "The Design of an Interface Editor for the Computer-Aided Prototyping System." September 1997.
- Ray, W. "Automatic Layout Techniques for the Graphical Editor in the Computer Aided Prototyping System." September 1997.
- Mock, C. "A Syntax Directed Editor for the Computer Aided Prototyping System." September 1997.
- Howell, M. "Analysis of a 3-Tier Distributed Architecture for the Sector Anti Air Warfare Center." September 1997.
- Coleman, M. "CHANNEL CAT: A Tactical Link Analysis Tool." September 1997.
- Kominiak, J. "Software System Requirements for the Fuel Automation Subsystem of the Integrated Combat Service Support System (ICS3) Using the Computer Aided Prototyping System (CAPS)." March 1998.
- Rambidis, T. "Security Issues for the Software Evolution Model." March 1998.
- Meckstroth, G. "A GUI Interface for Reusable Components Storage and Retrieval in the CAPS Software Base." June 1998.
- Steinbach, F. "CVX Control Information Technology Evolutionary Model." M.Sc. in Computer Science, NPS. March 1999.
- Bok, M. "Addressing the United States Navy Need for Software Engineering Education." M.Sc. in Computer Science, NPS. September 1999.
- Auguston, T. "Naval Architecture Environment: Facilitating JV2010." December 1999.
- Matsuo, E. "Risk Assessment in Incremental Software Development." December 1999.
- Gee, K. "An Architectural Framework for Integrating COT/GOTS/LEGACY Systems." June 2000.
- Allen, J. and T. Tran. "Interoperability and Security Support for Heterogeneous COTS/GOTS/Legacy Component-Based Architecture." June 2000.
- Nguyen, T. "Commercial Off-The-Shelf (COTS)/Legacy Systems Integration Architectural Design and Analysis." June 2000.
- Williamson, C. "A Sharp Evolution: Development of the Sierra Hotel Aviation Reporting Program from the Deck Plates." June 2000.
- Hensley, B. "Development of a Software Evolution Process for Military Systems Composed of Integrated Commercial Off the Shelf (COTS) Components." M.Sc. in Software Engineering, NPS. March 2000.
- Church, L. "Decision Support for Software Process Management Teams: An Intelligent Software Agent Approach." M.Sc. in Software Engineering, NPS. March 2000.

- Johnson, C. and Piirainen, R. "Application of the Nogueria Risk Assessment Model to Real-Time Embedded Projects". M.Sc. in Software Engineering, NPS. June 2001.
- Mandak, W. and Stowell, C., II. "Dynamic Assembly for System Adaptability, Dependability and Assurance (DASADA) Project Analysis". NPS. June 2001.
- Nelson, P. "A Requirements Specification of Modifications to the Functional Description of the Mission Space Resource Center". M.Sc. in Software Engineering, NPS. June 2001.
- Ramgolam, R. "A Guide to Selecting Software Metrics for the Acquisition of Weapon Systems". NPS. September 2001.
- Christie, B. and Young, P. "Integrated Development Environment (IDE) for the Construction of a Federation Interoperability Object Model (FIOM)". NPS. September 2001.

PH.D. DISSERTATIONS

- Steigerwald, R. "Reusable Software Component Retrieval via Normalized Algebraic Specifications." December 1991.
- Nguyen, D. "An Architectural Model for Software Component Search." December 1995.
- Nogueira, J. "A Formal Model for Risk Assessment in Software Projects." PhD Dissertation. September 2000.
- Ray, W. "Optimization of Distributed, Object-Oriented Architectures". Ph.D. Dissertation. NPS. September 2001.

DISSERTATION/THESES READ:

- Weigand, J. "Design and Implementation of a Pretty Printer for the Functional Specification Language Spec." June 1988.
- Porter, S. "Generation of a Syntax Directed Editor for Prototyping System Description Language." December 1988.
- Wyrick, L. "Evaluation of Technology Transfer: Conventional DBMSs to Object-Oriented DBMSs." March 1989.
- Kopas, R. "The Design and Implementation of a Specification Language Type Checker." June 1989.
- Beebe, D. "The Design and Implementation of a Syntax Directed Editor for the Specification Language Spec." June 1989.
- Kilic, M. "Static Schedulers for Embedded Real-Time Systems." December 1989.
- Ross, D. "Object Oriented Database Manager for a Low Cost Combat Direction System." December 1989.
- Dampier, D. "A Model for Merging Different Versions of a PSDL Program." June 1990.

- Depasquale, J. "Design and Implementation of Module Driver and Output Analyzer Generation." June 1990.
- Adams, R. "Assessment of the Feasibility of SDI." June 1990.
- Slyman, G. "System Engineering Analysis and Acquisition Strategy to Obtain Battle Group Organic Reprogramming." September 1990.
- Tyszberowicz, S. "OBSERV - A Prototyping Language and Environment." External examiner, Ph.D. Dissertation, Tel-Aviv University. October 1990.
- Tyszberowicz, S. "OBSERV - Object-oriented Based Specification, Execution, and Rapid Validation system." External examiner for Ph.D. thesis, Tel Aviv University. May 1991.
- De Paula, E. "A Tactical Database for the Low Cost Combat Direction System." December 1990.
- Waite, J. "An Ada Object Oriented Missile Flight Simulation." September 1991.
- Stockwell, M. "A Graphical User Interface for the Low Cost Combat Direction System." September 1991.
- Bolick, W. and R. Irwin. "The Integration System for the Low Cost Combat Direction System." September 1991.
- Bayramoglu, S. "The Design and Implementation of an Expander for the Hierarchical Real-time constraints of CAPS." September 1991.
- Schweiger, J. "Detecting Potential Synchronization Constraint Deadlocks from Formal System Specifications." March 1992.
- Dixon, R. "The Design and Implementation of a User Interface for the Computer Aided Prototyping System." September 1992.
- Sealander, J. "Building Reusable Software Components for Automated Retrieval." September 1992.
- Poulis, T. "Using an Object-Oriented Database Management System to Enhance the Reusability of Class Definitions." September 1992.
- Ozdemir, D. "The Design and Implementation of a Reusable Component Library and a Retrieval/Integration System." December 1992.
- Byrnes, R. "An Experimental Investigation of Alternative Software Architectures and Languages for Autonomous Vehicle Control Systems." Ph.D. Dissertation. March 1993.
- Badr, S. "A Model and Algorithms for a Software Evolution Control System." Ph.D. Dissertation. December 1993.
- Dampier, D. "A Formal Method for Semantics-Based Change-Merging of Software Prototypes." Ph.D. Dissertation. September 1994.
- Cordeiro, M. "Distributed Hard Real-Time Scheduling for a Software Prototyping Environment." Ph.D. Dissertation. March 1995.
- Drimousis, J. "Analysis for the Purpose of Developing Course Material for Instructing Graduate Students in Object Oriented Programming With Ada 95." March 1995.

- Stern, A. “Tracing Software Evolution through Requirements Spaces.” Ph. D. Dissertation Examiner, University of Oxford, UK. May 1995.
- Ibrahim, O. “A Model and Decision Support Mechanism for Software Requirements Engineering.” Ph.D. Dissertation. September 1996.
- Pinheiro, F. “Evolution of a Project Metric.” Ph. D. Dissertation Examiner, University of Oxford, UK. December 1996.
- Lange, D. “Hypermedia Analysis and Navigation of Domains.” September 1997.
- Kropp, C. “Integrated Evolution Control System.” March 1998.
- Ruiz, N. “Smartship Project Modeling.” June 1998.
- Montague, B. “The Soft-Instruction Software Architecture.” Ph.D. Dissertation University of California, Santa Cruz. December 1998.
- Kominiak, J. “Software System Requirements for the Fuel Automation Subsystem of the Integrated Combat Service Support System (ICS3) Using the Computer Aided Prototyping System (CAPS).” March 1998.
- Mandak, W. and C. Stowell, II. “Dynamic Assembly for System Adaptability, Dependability and Assurance (DASADA) Project Analysis.” June 2001.
- Ramgolam, R. “A Guide to Selecting Software Metrics for the Acquisition of Weapon Systems.” September 2001.
- Nelson, P. “A Requirements Specification of Modifications to the Functional Description of the Mission Space Resource Center.” June 2001.
- Christie, B. and P. Young. “Integrated Development Environment (IDE) for the Construction of a Federation Interoperability Object Model (FIOM).” September 2001.
- Ray, W. “Optimization of Distributed, Object-Oriented Architectures.” September 2001.